

Volume 4

ARLIS
Alaska Resources
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Anchorage, Alaska

1962-1963

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STATE OF ALASKA

William A. Egan, Governor



ANNUAL REPORT OF PROGRESS, 1962 - 1963

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-4

SPORT FISH INVESTIGATIONS OF ALASKA

Alaska Department of Fish and Game

Walter Kirkness, Commissioner

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Alex H. McRea, Director

Sport Fish Division

Richard Haley, Coordinator

INTRODUCTION

This report of progress consists of Job Segment Reports from the State of Alaska Federal Aid in Fish Restoration Project F-5-R-4, "Sport Fish Investigations of Alaska".

The project is composed of 25 separate studies designed to evaluate the various aspects of the State's recreational fishery resources. While some studies are of a more general nature and deal with gross investigational projects, others have been developed to evaluate specific problem areas. These include studies of king salmon, silver salmon, grayling and State Access requirements. The information gathered will provide the necessary background data for a better understanding of local management problems and development of future investigational studies.

The assembled progress reports may be considered fragmentary in many respects due to the continuing nature of the respective studies. The interpretations contained therein, therefore, are subject to re-evaluation as work progresses and additional information is acquired.

JOB COMPLETION REPORT

RESEARCH PROJECT SEGMENT

State: ALASKA Name: Sport Fish Investigations of Alaska.

Project No. F-5-R-4 Title: Experimental rehabilitation and stocking of lakes, Upper Southeast Alaska.

Job No: 3-E

Period Covered: July 1, 1962 to April 15, 1963
Southeast Alaska

Abstract:

Glory Lake is a 222 acre lake located in the Tongass National Forest approximately ten minutes by air from Juneau. This lake was selected for rehabilitation using toxaphene as the fish eradicator.

Depth sounding of the lake revealed it to be in excess of 300 feet. The volume, to the 300 foot contour, was found to be 40,844 acre feet. The fish population was found to be composed entirely of "stunted" Dolly Varden, Salvelinus malma (Walbaum). Ample food and spawning area are present.

Rehabilitation of this lake will be undertaken in 1963. Subsequent restocking will be with Arctic grayling, Thymallus arcticus (Pallas), so that this species may be introduced to the sport anglers of the Juneau area.

Recommendations:

1. Further aquatic invertebrate, vertebrate and chemical data be collected immediately prior to rehabilitation.

2. Rehabilitation, using toxaphene as the toxicant, be undertaken following the fry emergence in early 1963.

3. The period of toxicity be determined through the use of fish suspended in live boxes at various depths and locations.

4. Quantitative and qualitative measurements of aquatic invertebrates be made periodically after rehabilitation until the lake is found suitable for supporting fish life.

5. Arctic grayling be introduced when detoxification is complete.

Objectives:

To evaluate the use of toxaphene in manipulating and controlling fish populations.

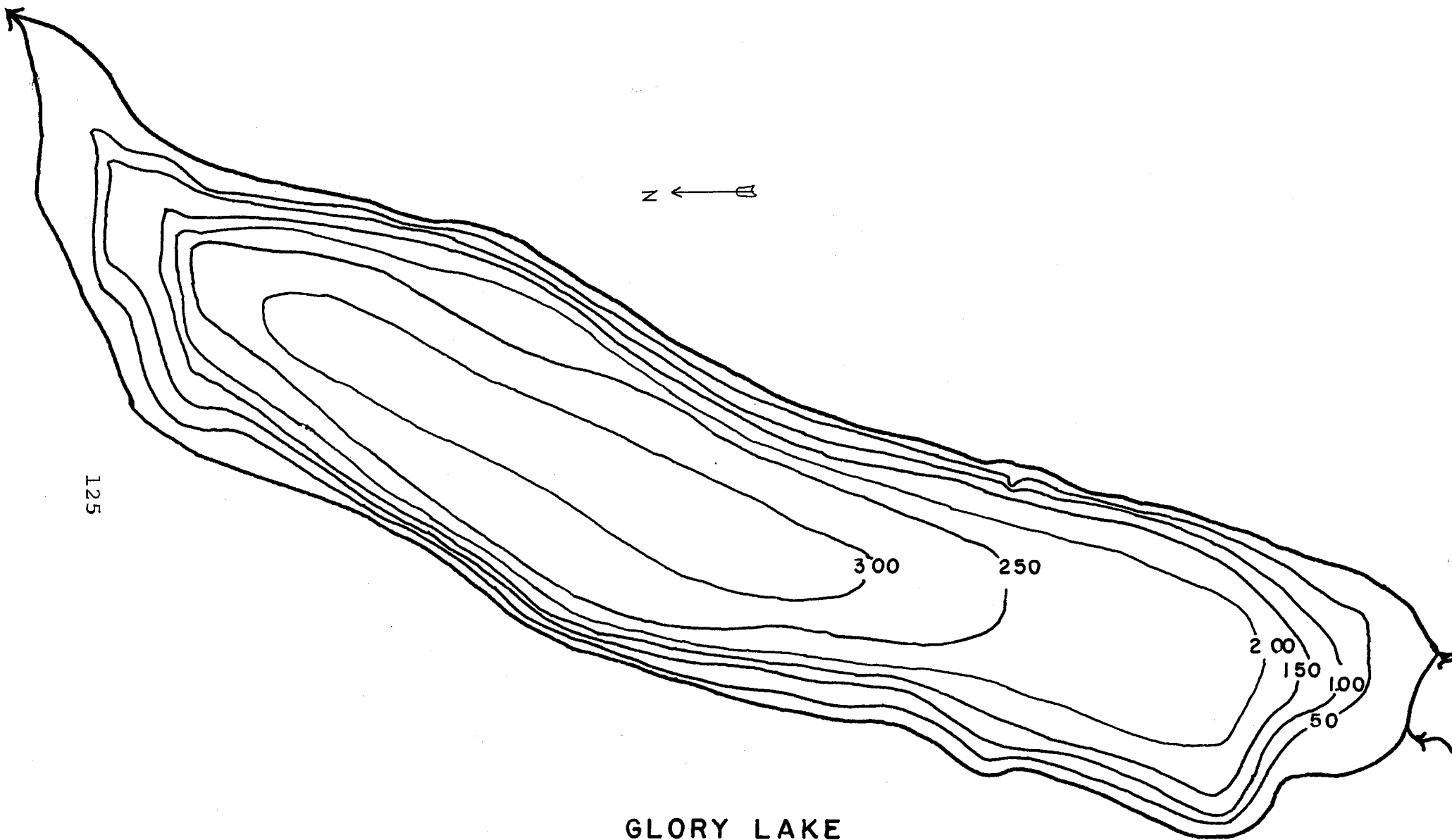
Techniques used:

Background information from prior studies conducted by the Alaska Department of Fish and Game and other agencies was utilized in planning and directing the course of this project.

An enlarged outline map of Glory Lake was prepared from an aerial photograph. This map was then utilized as a guide in sounding the lake with a Bendix recording fathometer.

The soundings were then plotted and the lake volume was computed.

Fish populations were sampled by the use of variable mesh 125 foot gill-nets. Fish captured were studied to determine age and growth rates, food habits and species composition.



GLORY LAKE

TONGASS NATIONAL FOREST

LONG. 134° 08' W LAT. 58° 24' 20" N

SURFACE AREA 221.7 ACRES



SCALE 1 INCH = 660 FEET

Invertebrate populations were sampled with an Ekman dredge. Samples were taken in 10 foot water depth intervals to the 50 foot contour.

Spawning sites were inspected by visual observation in the inlet and outlet streams.

Chemical water analysis was attempted through the use of a Hach colorimeter.

Findings:

Glory Lake was first visited in August. At this time an attempt to plot the bottom contours of the lake using a sounding line was unsuccessful because of the extreme depth encountered. A Bendix recording fathometer was utilized on a later trip. The maximum range of this fathometer is 300 feet. Depths in excess of this range were encountered in the middle of the lake. (Figure 1). Calculations revealed the lake to have a surface area of 221.7 acres and a volume, to the 300 foot contour, of 40,844 acre feet. The amount of 60 per cent toxaphene required to achieve a concentration of .007 parts per million to the 300 foot contour was calculated to be 130.4 gallons.

Ekman dredge sampling revealed the invertebrate population to be composed of Diptera, Tricoptera Mollusca and Nematoda. Sampling to the 50 foot contour gave the following volumetric measure of production: 10 feet - 9.3 milliliters per square foot; 20 feet - 4.6 milliliters per square foot; 30 feet - 4.0 milliliters per square foot; 40 feet - 3.2 milliliters per square foot and 50 feet - .8 milliliters per square foot.

The outlet of Glory Lake flows northeasterly approximately one-quarter mile before reaching a 200 foot

vertical fall. The water then flows under Norris Glacier for one-half mile before discharging into Taku Inlet.

The lake's major inlet is approximately two and one-half miles long, of which the first mile offers excellent spawning facilities.

Glory Lake was test-netted for 72 hours with a resulting catch as follows:

TABLE I. Results of Test-net Set for 72 hours in Glory Lake, August 28-31, 1962

Species	Fork Length Inches	Weight Grams	Sex	Stomach Contents	Age Years
Dolly Varden	4.9	23	imm. female	Unidentified	2
Dolly Varden	5.6	38	mature female	Diptera	3
Dolly Varden	6.1	43	mature female	Diptera	3
Dolly Varden	6.4	52	mature male	Caddis	3
Dolly Varden	6.4	52	mature male	Unidentified	3
Dolly Varden	6.9	53	mature male	Empty	3
Dolly Varden	7.5	70	mature male	Unidentified	4

Water temperatures at 10 feet intervals to the 200 foot contour were taken on August 29 using an electronic thermometer. (Table 2)

TABLE II. Water Temperature of Glory Lake to the 200 foot Contour, August 29, 1962

<u>Depth</u>	<u>Temperature</u>	<u>Depth</u>	<u>Temperature</u>
Surface	51.0	110	38.0
10	49.3	120	38.0
20	48.5	130	38.0
30	48.0	140	38.0
40	44.0	150	38.0
50	41.0	160	38.0
60	40.0	170	37.5
70	39.0	180	37.5
80	38.5	190	37.5
90	38.0	200	37.5
100	38.0		

Attempts were made to obtain chemical data of the water but a failure in equipment rendered the findings unreliable.

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Date: February 4, 1963

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